

Ch 3, Data Analytics: Drawing Conclusions, Part 2

Digital systems, 165-170

Digital systems (Informatics, p 165)

1. What are the components of an information system?
Hardware, software and networks
2. What is a digital system?
Digital system is hardware for input, output, storage and communication.
3. Define hardware. Give some examples.
Hardware is made up of input hardware, which enables users to input data or provide commands to software, output hardware, which give information to the user, storage hardware, which stores data and software, and communication hardware.
4. What are the most common types of output hardware?
Monitors; LCD, OLED, Plasma and Electronic paper, and Printers; Laser Inkjet, Thermal

Storage, p 167

5. Distinguish between primary and secondary storage.
Primary storage; short term storage, which is what you know as random access memory, or RAM. RAM is composed of billions of storage locations in silicon chips. RAM stores program instructions and data when programs are running. RAM chips are volatile and lose their data when power is turned off.
Secondary storage; long term storage and includes many kinds of disk drives such as HDD, SSD and NAS.
6. Describe the characteristics of the following storage devices:
 - a. Hard disk drive, HDD
 - Aluminium disks densely crammed with magnetically recorded bits 1 to 0 (Binary code)
 - Spinning at up to 10 000RPM, they store and retrieve data at incredible speed, with breath-taking accuracy and reliability.
 - Very cheap per megabyte of capacity; still the largest, most reliable long-term storage media.
 - In 2015, a 6TB (6 terabytes = 6000 gigabytes) HDD cost approximately \$375AUD – around 16GB of storage per dollar.
 - b. Solid state drive, SSD
 - Non-volatile memory similar to USB flash drives and SD cards.
 - Run silently, start instantly, generate less heat and use less electricity.
 - Have no motors that will age and eventually fail.
 - Tends to access data faster than a HDD.
 - Stores less data per square centimetre of storage space.
 - Have a limited number of times they can re-write a memory cell; after approximately 1 million writes, a memory cell will become unpredictable, or fail.
 - Quite expensive: in 2015, a 128GB SSD cost approximately \$105AUD – around 1GB of storage per dollar.
 - c. Network-attached storage, NAS
 - A network team of HDDs in a box.
 - Makes file sharing easier.
 - Increases capacity considerably (for example, 12TB)
 - Offers data protection, such as hot-swap disks.
 - Convenient and reliable.

Networks and communication, p 168

7. List the different types of network and communication hardware.
 - Ports: Are the physical sockets that carry data between a computer and peripheral (external) devices.
 - Modems: convert digital data into analogue data for transmission over non-digital media, such as telephone lines, and convert incoming analogue data into digital data for the computer to use. The two most common types of modem are ADSL and cable.
 - Switches: are boxes that allow multiple network cables to interconnect and exchange data between networked devices.
 - Routers: are used as gateways to interconnect LANs and they guide data packets across networks and the internet.

- Cables: are used to connect two devices, enabling the transfer of signals from one device to another. The most common networking cable is CAT.
- Wireless access points: are devices used on wireless LANs. They act as central transmitters and receivers of wireless radio signals and allow wireless devices such as phones or tablets to connect to the wired network.

Software, p 169

8. Define software.

The programming code that controls hardware.

9. Distinguish between:

a. Application software

A word processor; does work for the user and create information.

b. System software

An operating system, device drivers; controls hardware and allocate computer resources so application software can run.

c. Utility software

A text editor; provides a single, specific service to extend the functionality of digital system.